

CHAPTER 13

Controlling Non-Strategic Nuclear Forces

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Nearly a decade after the Presidential Nuclear Initiatives (PNIs) that removed the impetus for negotiations on nonstrategic nuclear forces (NSNF), the disproportionately large NSNF inventory retained by the Russian Federation is a concern in the United States and elsewhere. Concerns over “loose nukes” that followed the collapse of the Soviet Union, and a growing sense that the Russians have not fulfilled their pledges, have kept tactical nuclear weapons on the political agenda. Moreover, their large numbers raise questions about their impact on the strategic nuclear reduction process. Some of these tactical weapons can probably be mounted on strategic delivery systems, thus frustrating efforts to negotiate equal low strategic warhead levels.

To address these issues, many participants and observers have called for NSNF arms control negotiations. One approach put forward would revisit the idea of placing overall ceilings on nuclear warheads, with freedom to mix strategic and NSNF forces below this level. The Russians are likely to reply that they require larger overall numbers to provide deterrence against a larger number of nuclear-armed potential adversaries. Another approach advocated is a separate limit or ban on NSNF. However, both sides still see the need for limited numbers of tactical weapons (NATO is not likely to abandon its “last resort” reliance on nuclear deterrence anytime soon) and, to date, the Russians have not been willing to engage seriously on NSNF talks. Moreover, any agreement would have to deal with weapons rather than delivery systems, raising the issue of monitoring reductions and limits on warheads.

In this context, this chapter explores the issues surrounding possible NSNF arms control. The following discussion will address the PNIs of 1991–1992; renewed concerns leading to the

1997 Helsinki Summit language on NSNF negotiations; proposals for NSNF negotiations; possible elements of an NSNF negotiating framework; NSNF issues and verification challenges, particularly for warheads; and some preliminary conclusions.

Earlier Interest in NSNF Negotiations

Following the conclusion of the Intermediate-Range Nuclear Forces (INF) Treaty in 1987, and in a climate marked by warmer relations between East and West, the impending unification of Germany, and an ambitious Soviet arms control agenda presided over by Mikhail Gorbachev, there was considerable interest in addressing short-range nuclear forces, especially those deployed in Europe. As the political momentum for an agreement built, the United States and NATO began to develop their negotiating positions.

In the final declaration of the NATO Summit held in London on July 5-6, 1990, the leaders of the Atlantic Alliance stated that: “New negotiations between the United States and the Soviet Union on the reduction of short-range nuclear forces should begin shortly after a CFE [Conventional Armed Forces in Europe] agreement is signed. The Allies concerned will develop a framework for these negotiations which takes into account our requirements for far fewer nuclear weapons, and the diminished need for sub-strategic nuclear systems of the shortest range.”² This commitment to NSNF negotiations reaffirmed earlier NATO calls in the spring of 1989 and 1990. By the time of the summit, changes in Europe, especially the impending unification of Germany, appeared to make NSNF talks inevitable. Following the signing of the CFE treaty at the Paris Summit in November 1990, many observers expected NSNF negotiations to begin no later than mid-1991.³

Unilateral, Reciprocal Approaches to NSNF

Before outstanding issues were resolved, and negotiations begun, interest was eclipsed by unilateral cuts in NSNF offered by U.S. President George Bush and reciprocated by Soviet President Mikhail Gorbachev and, shortly thereafter, by Russian President

Boris Yeltsin. These unilateral, reciprocal cuts are known as the Presidential Nuclear Initiatives. On September 17, 1991, President Bush offered to eliminate the entire worldwide U.S. inventory of ground-launched theater nuclear weapons, and to destroy all nuclear artillery shells and land mines, as well as the warheads for short-range ballistic missiles and for no-longer-deployed air-defense missiles. The President also pledged to withdraw all tactical nuclear weapons from U.S. surface ships, attack submarines, and land-based naval aircraft, and to dismantle and destroy many of these warheads, while centrally storing the rest.

President Bush called on the Soviet President to reciprocate, and Gorbachev pledged to do so in the waning days of the Soviet Union on October 5, 1991. His offer stated, *inter alia*, that all nuclear artillery and warheads for tactical nuclear missiles would be destroyed; that nuclear warheads for anti-aircraft missiles would be removed from the Army and placed in central storage, with some to be destroyed; that all nuclear mines would be eliminated; and that all tactical nuclear weapons from surface ships, multi-purpose submarines, and ground-based naval aviation would be stored, with some destroyed. In addition to these reciprocal pledges, Gorbachev also seemed intent on prodding the United States to remove and destroy naval tactical nuclear weapons and to remove and store air-delivered theater nuclear systems. After the Soviet Union collapsed and Gorbachev lost power, Russian President Yeltsin reaffirmed the Gorbachev pledges on January 29, 1997. He also clarified them to some extent, declaring that Russia would eliminate one-half of the warheads for air-launched tactical systems and air-defense missiles, and one-third of sea-based tactical systems. Although these unprecedented pledges removed the impetus for NSNF negotiations that had been building for some years, neither the reductions nor the destruction of systems was subject to verification.

Renewed Concerns and the Helsinki Joint Statement

Dramatic changes in the international security environment since the PNIs were put forward, particularly the growing concern

over the proliferation of weapons of mass destruction (WMD) makes action in this realm imperative. Even though the withdrawal of forces from Eastern Europe has reduced the Russian nuclear threat to NATO, large numbers of Russian NSNF under uncertain security remains a concern to NATO states and beyond. Indeed, proponents from European countries, especially Scandinavia, have been in the forefront on arms control proposals regarding NSNF in recent years. U.S. internal deliberations have reportedly reflected these concerns, at least to some extent.

These concerns were partly responsible for the U.S. and Russian Presidents at the Helsinki Summit expressing a political commitment to NSNF discussions. In a joint statement, the Presidents of the United States and the Russian Federation agreed to explore possible measures relating to long-range nuclear submarine-launched cruise missiles (SLCMs) and tactical nuclear weapons. Discussions on these systems are to take place in the context of, but separate from, the negotiations on a third agreement on reducing strategic nuclear arms, which was the focus of this joint statement.⁴

The Helsinki language reflected growing concern about NSNF, at least on the part of the United States, and raised the prospect that negotiations on these forces will once again appear on the arms control agenda. The Helsinki pledge is vague about whether a negotiated settlement is desired and, given the lack of action since the summit, there is the possibility that there will be no NSNF negotiations.

NSNF Proposals

There have been a series of recent proposals for NSNF negotiations.⁵ Some of these proposals contemplate further rounds of unilateral, reciprocal reductions, and possibly unilateral moves. In this context, a broadening of the scope of earlier unilateral moves and possibly some transparency measures are called for. "Corrals," or the secure storage of NSNF, whether informal or formal, should also be considered.

Both of these concepts may be early measures in a multi-phase process.

Negotiations to formalize or consolidate earlier PNIs are also called for. In most cases this means making them legally-binding and verifiable. Some also see value in broadening the scope of the original PNIs in this process, in order to address residual arsenal asymmetries.

Other negotiation options might lead to numerical or geographical limits. In the former case, there are calls for reductions to some agreed level, or even the elimination of NSNF. Geographical limits (global or regional) have involved proposals to end overseas deployments; to end European deployments (or at least a legally-binding commitment not to deploy NSNF on new NATO members' territories); nuclear-weapon-free zones (e.g., in Central-Eastern Europe); and even a global ban on air-delivered warheads. Negotiations involving a merger with the strategic arms reduction process and an overall ceiling on *all* nuclear warheads have been suggested, as well.

In addition to negotiated and non-negotiated arms control options, some have proposed no arms control at all. Instead, they suggest defense security cooperation modeled on the Cooperative Threat Reduction (CTR) or Lab-to-Lab programs. In effect, the approaches put forward in this context, and at least some of the issues they raise, may be identical to those in the arms control realm. The difference is in the process, and the belief that the models being considered have been far more effective than traditional negotiated arms control.

Prospects

What are the prospects of reaching agreement on NSNF, whether negotiated or non-negotiated? A first-order response must address the objectives of the participants. Only U.S. and Russian objectives will be considered below, but third party states are important and their perspectives will need to be addressed, too.

The primary objectives of NSNF negotiations, from the U.S. perspective, would be the elimination of redundant NSNF warheads in order to prevent their acquisition by so-called “states of concern,” terrorists, and others; the promotion of strategic arms control to ensure that Strategic Arms Reduction Talks (START) agreements are effective (i.e., not undermined by unregulated NSNF); and the promotion of European security by cooperation and confidence building, as well as by limiting the future reintroduction of large numbers of Russian NSNF into the European security calculus if relations with Russia take a downturn. Alliance management will be critical, and challenged by the pursuit of an NSNF agreement. Would the United States and its NATO allies be willing to pay for a reduction or elimination of this threat by ending U.S. nuclear deployments in Europe?

On the basis of these considerations, in any negotiated NSNF agreement, U.S. interests and requirements suggest the need to:

- Ensure the security of Russian NSNF, including the elimination of large numbers of these weapons;
- Remove potential problems for the START process and deeper non-strategic cuts that derive from a large and uncertain Russian NSNF stockpile;
- Ensure these systems do not pose a military threat to U.S. forces or change the U.S.-Russian nuclear balance;
- Protect some number of remaining air-launched systems and conventional missile capabilities (in other words, avoid a total NSNF ban);
- Protect U.S. NSNF deployments in Europe; and
- Avoid any negative impacts on NATO and European security, while promoting an improved European security environment.

The U.S. objectives strongly suggest the desirability of warhead controls, which the United States favors.

There is a perception that the United States has a stronger interest in the goals listed above than does the Russian

Federation, despite historical Soviet interest in inclusion of some NSNF in strategic arms control. One of Russia's primary interests in an NSNF agreement would be the elimination of the U.S. nuclear forces deployed in Europe, especially in light of the Russian Federation's declared concerns about NATO expansion. A tradeoff of NSNF and sea-launched cruise missiles might also be attractive to the Russians, as suggested by the Helsinki Summit language. Precisely because of the U.S.-Russian NSNF and SLCM asymmetries, and the sensitive issues involved with SLCMs, a deal may seem beneficial to the Russians.

With these considerations in mind, it is not clear the Russians will be interested in NSNF controls. Even if they were, they would undoubtedly seek to:

- Preserve Russian capabilities at some level as a counter to U.S. and NATO conventional capabilities;
- Eliminate the last U.S. nuclear forces in Europe or, if this proves impossible, secure a legally binding commitment to preclude deployments in new NATO member States;
- Limit U.S. SLCMs, the U.S. upload "hedge," and possibly other U.S. strategic capabilities; and
- Place limits on third party states.

Unlike the U.S. objectives, these objectives are not intrinsically connected to warhead controls. There is reason to believe that the Russians would not favor warheads as units of account; they would prefer to look to delivery systems or non-deployment (nuclear-free) zones to realize their objectives.

Possible Incentives for an NSNF Deal

From the perspective of U.S. and Russian objectives, then, there are stark differences between the two states. The United States is seen as the principal proponent of NSNF arms control, and is recognized as the state that needs to take the initiative if anything is to be done. A key question is whether the United States will do so. If so, there are some doubts as to whether the Russians will be enticed. On this point, arguments put forward include the belief that because the Russians have accepted asymmetric

reductions before, they will do so again. Also, it is argued that Russian interest in NSNF is not rational, that no threats justify these systems, and that they are unusable, counterproductive and costly. Accordingly, despite Russian rhetoric, an agreement is possible, in this view, if the Russians can be shown the error of their ways.

Such arguments may be correct in the end, but they do not appear particularly compelling at present. More compelling is the recognition that the Russian NSNF stockpile is becoming obsolescent and more costly, creating an opportunity for the United States to accelerate those naturally occurring reductions.

If this is the case, what are possible incentives for the Russians? The United States could, in principle, address such Russian security concerns as:

- NATO enlargement;
- The U.S. nuclear presence in Europe;
- Conventional force disparities of the Russian Federation in Europe and globally);
- Theater and national missile defense (T/NMD) issues;
- U.S. strategic forces (including the upload hedge and sea-launched cruise missiles); and
- French, Chinese, and other third party forces.

Can these concerns be met? It would be difficult at best, and not fully in any case. Can other Russian needs, for example, environmental issues, be addressed? Possibly, but their role in an NSNF accord is vague. What of other incentives, including financial assistance and cooperation with the West? Such incentives must be part of any package, and are doable. Are they enough by themselves? Probably not.

Establishing a Negotiating Framework

Ultimately then, the differences between the United States and Russia are glaring, and it is not clear that divergent interests and objectives can be bridged. Nonetheless, however one judges the prospects for an agreement, it is useful to consider what steps are

necessary in order to proceed. If a unilateral reciprocal or other informal approach is desired, the path ahead may be difficult but should be clear. However, if there are to be any formal negotiations, before they can begin key framework issues will need to be resolved. If a negotiated agreement remains a political requirement, decisions on the issues of scope, systems, and units of account are critical, and have far reaching implications.

Scope

Geographically, the scope of the talks could be global or limited to Europe. There is probably a desire on the part of the United States to consider global reductions, if the objective is to formalize the PNIs of 1991-1992, which were global in scope. Russia might be more interested in eliminating systems in Europe than pursuing global reductions but, if this objective is deemed not achievable, a formalization of the earlier pledges might be acceptable. European states may have widely different views, depending in part on whether or not they are NATO members. If a European scope were to be decided, for whatever reason, Japan, China, and other states would likely press for a global ban, as they did during the INF negotiations.

Systems and Units of Account

Systems to be reduced or eliminated could include:

- Missiles with ranges of less than 500 kilometers;
- Artillery shells; and
- Bombs and tactical air-to-surface missiles.

The unit of account for the negotiations could be these systems, or it could be:

- Missile launchers;
- Dual-capable artillery; or
- Warheads and, perhaps, special nuclear material (SNM).

Dual-capable aircraft would not, presumably, fall into any range limitations for NSNF, but because they are a potential means of

delivering NSNF there would likely be pressures for their inclusion in the talks by Russia.

What is new in these framework issues is the possibility, recognized in the Helsinki Summit language, of addressing warheads as the unit of account. If NSNF negotiations include warheads as the unit of account, and if the storage or disposition of warheads is intrusively monitored, the implications are immense. The U.S. Government has not included warheads in the scope of previous negotiations on nuclear arms (except marginally in the Intermediate-Range Nuclear Forces (INF) treaty, where the aeroshells from warheads were crushed) both because warheads without delivery systems are virtually unusable, and because of the difficulty of effectively verifying the disposition of warheads. Even in the historic strategic nuclear warhead dimension of START III, the framework of which was decided in Helsinki, controls over and accounting for warheads seem to have been accorded an ancillary role.

Despite interest in addressing warheads, then, to do so poses significant and perhaps unsolvable problems. An NSNF agreement, in principle, could provide for addressing warheads and their disposition in subsequent talks. While this outcome is possible, to leave this issue for later consideration would complicate already vexing problems because the pressures to resolve these issues could lead to unworkable solutions. With these points in mind, let us consider the issues and implications of warhead controls in more detail.

Issues and Implications of Addressing Warheads and Materials

The Russian Federation, and possibly the United States, is virtually certain to continue to reduce its NSNF stockpiles, pursuant either to unilateral decisions or negotiated agreements. A political imperative for rapid action persists because of concerns about “loose nukes,” illicit trafficking in nuclear warheads, and the like. U.S. nonproliferation goals reinforce this imperative. The character of these reductions – whether unilateral actions, cooperative steps, or negotiated agreements

associated with START III – will pose lesser or greater demands on U.S. policy makers and technologists. Negotiated warhead reductions will be difficult to conclude, as illustrated by recent U.S. experience with less sensitive negotiations such as Cooperative Threat Reduction, materials protection, control, and accounting (MPC&A) activities, the highly enriched uranium transparency agreement, and so on.

If a deal seems possible, the issue of warhead arms control might still create difficulties. The United States is interested, and the U.S. arms control and national security communities realize that strategic warhead controls make no sense without controls on NSNF warheads. Although the Russians do not appear to favor warhead controls, they might be induced to accept them. The difficulties are immense. However, even though any agreement which used warheads as a unit of account would create serious verification and other problems and raise concerns about the release of classified or sensitive information, there may be no good alternative.

An NSNF agreement that used warheads as its unit of account could incorporate warhead monitoring, which could involve monitoring production, deployment, storage, and elimination (dismantlement or other disposition) as part of its verification measures. All of these possibilities are beset with serious technical, resource, security and political implications. Negotiated reductions will pose especially thorny issues and problems.

Transparency/Verification of Warhead Reductions

Verification of an NSNF agreement truly would be challenging under any circumstances, but especially so if warheads were units of account. Various approaches to an NSNF agreement that covered warheads could be very intrusive. However, a verification regime that protects design and other information (which is essential on grounds of law, policy and security) may not be sufficiently intrusive to ensure verification of noncompliance. Verifying warhead storage is easier than verifying the disposition of materials, but it too is difficult at levels of intrusiveness that would allow sufficient confidence.

Beyond the intrinsic challenges of warhead verification, uncertainties about Russian warhead and special nuclear material stockpiles, and the prospect of clandestine production, would undermine confidence in any negotiated option if not addressed.

Reflecting the difficulties of verifying warheads, perhaps, the Helsinki language refers to transparency measures. But transparency is as yet undefined in this context. In addition to warheads there is also a reference in the Helsinki joint statements to considering transparency on materials (presumably of weapon-origin). This might be pursued in an NSNF agreement in addition to a host of bilateral and multilateral initiatives in materials verification or transparency. The challenges are formidable.

With these considerations in mind, depending upon the provisions that are agreed, the monitoring of classified or sensitive items could pose technical problems not confronted before. Both sides also have experience in dismantling nuclear warheads safely and accountably, but they have very limited experience in providing transparency and verification of warhead elimination. The United States can likely develop techniques and technologies to provide a degree of bilateral transparency for warhead reductions in a manner that preserves other essential interests (for example, the protection of design information). But if they are to provide real verification of the elimination of warheads or materials, the United States and Russia would have to develop new and innovative monitoring approaches, and perhaps new technologies.

Technical verification issues also surround the storage or other disposition of special nuclear materials removed from dismantled warheads. While specific verification requirements depend upon the disposition option or options chosen, the United States has valuable, relevant experience with International Atomic Energy Agency (IAEA) safeguards. But applying multilateral experience and technologies to a bilateral regime, or bringing in the IAEA in a multilateral approach to bilateral warhead elimination activities, would raise additional political and technical issues. For example, a multilateral verification

approach would have increased proliferation dangers which would need to be addressed. The United States and Russia have also gained important insights and worked together effectively to develop and apply technologies for the Russian MPC&A program and other cooperative activities. This also provides a base for further monitoring improvements. Assuring that the various options for storage are safe, secure and environmentally benign is difficult, and it is complicated by the politics of plutonium use. New technical solutions to the problems of ensuring safety and security may be required, especially if dealing with materials rather than weapons.

Security

Security in the sense of protecting classified and sensitive information should be a manageable problem for the less ambitious approaches to warhead reduction. Security should be achieved for unilateral options, but could be extremely difficult to assure for negotiated options that require high-confidence verification or even elaborate transparency measures. Both parties will be anxious to protect nuclear weapon design information, classified national security information, and other sensitive information. If the parties are able to negotiate an agreement to share some classified information, it should then be possible to devise monitoring schemes that provide increased confidence while still protecting the most sensitive information. However, such systems have yet to be fully developed or carefully considered. The use of “red-teaming” should help to identify potential vulnerabilities, and to understand the implications of uncertainties about initial inventories of warheads and special nuclear materials.

Human and Material Resources

The storage or elimination of warheads will require resources, including those dedicated to personnel, facilities, and possible start-up and operating costs. Storing complete warheads is probably the least expensive immediate approach. Another relatively inexpensive approach is to partly disassemble warheads and store their components. Both the United States and Russia eventually dismantle their retired warheads. If the fissile components can be stored safely for long periods (which may not

be the case with Russian designs), the chief costs here might be for expanded storage facilities and the monitoring systems associated with them.

Approaches involving dismantling components and converting materials, then storing or otherwise disposing of them, are likely to be much more expensive. They could seriously drain weapon-complex funding and capabilities if paid for from current budgets. The refitting of nuclear facilities that may be required for specific tasks, such as devising separate monitored disassembly facilities or material conversion processes, would be costly. It also might prove necessary to redesign facilities or cease operations for extended periods to protect sensitive and classified information during inspections, imposing further costs. Since Russia is likely to be unable and unwilling to pay for an elaborate NSNF warhead elimination regime, the United States might need to consider funding Russian disarmament. This would be contentious both in Russia and the United States.

Other Issues

Other issues complicate these monitoring and verification questions, including the large size and uncertainties about warhead and SNM stockpiles of the former Soviet Union, significant asymmetries between the weapon complexes and practices of the United States and Russia, and the need to address the prospect of clandestine future production, however unlikely. Any of these issues could undermine confidence in negotiated options.

Conclusion

The U.S. Government has yet to make decisions on the scope of the NSNF talks, nor has it determined verification requirements (which are dependent on the scope). From a U.S. perspective, as the more likely initiator of a negotiated or non-negotiated accord, what problems and issues require a solution? Alliance management requirements aside, it seems the US will desire to do a number of things:

- Promote the reduction of nuclear security concerns in the Russian Federation.⁶
- Promote strategic arms control and ensure effective and viable agreements.⁷
- Promote cooperative security and confidence-building in Europe.

In addition, there are military-operational concerns, put forward primarily by the Pentagon, that may become national goals, including a desire to reduce Russian capabilities and to maintain some level of U.S. capability.

If these are the “problems,” what, if any, NSNF actions might constitute a “solution?” Can these problems and issues effectively be addressed? In practice, no obvious solutions appear politically or technically feasible. Certainly formal negotiations—however configured—are not a silver bullet.

The only way to get a real handle on NSNF security, and the relationship of these weapons to strategic arms control and the real military threats they pose (while maintaining some capability) is the warhead control route.⁸ Specifically, U.S. goals can best be realized through global warhead reductions (albeit without a zero option), elimination of reduced arms, and monitoring of materials derived therefrom. However, this only holds if these steps can be verified effectively or opened to adequate transparency measures.

Such an approach probably only makes sense in connection with strategic arms, that is, in the context of overall ceilings of strategic and tactical weapons. It may not require a full-blown negotiated agreement, but it does need a transparency and verification element. The defense security cooperation model, based on such successful programs as CTR and Lab-to-Lab, may be appropriate. The Russian Federation is clearly not interested in such an approach now. Even if the Russians were interested, we cannot meet all the relevant challenges today, whether an agreement were negotiated or not.

As no agreement is likely for the foreseeable future, there is now time to address the monitoring and verification challenges that would arise from agreement on the reduction and elimination of NSNF warheads and/or materials. An early step is to identify the best technologies for accomplishing the actual verification of warhead elimination and, perhaps, materials disposition. Key needs will be systems to confirm that real warheads, perhaps specific kinds of warheads, are being introduced into the dismantlement process (chain-of-custody, tags and seals, radiation measurements, etc.); confirmation of dismantlement itself (perhaps even observation of dismantlement); identification of components resulting from dismantlement in the output stream (including both uranium and plutonium parts); monitoring of long-term storage of components and/or fissile materials; and monitoring of the ultimate disposition or use of the resulting materials.

All of the technical options remaining on the table would have different advantages and disadvantages, and the difficulty of determining the most acceptable approach in light of political and technical uncertainties is daunting. The changes in the international security environment have significantly altered the status of these matters from the perspective of the United States, for the first time opening a window to their being addressed and possibly resolved. Creating the grounds for an effective NSNF warhead agreement is an important goal. In turn, an NSNF agreement would provide experience with these systems and procedures which could frame needs for verification of deeper, and riskier, reductions in the strategic sphere.

Endnotes

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² "London Declaration on a Transformed North Atlantic Alliance," issued by Heads of State and Government participating in the meeting of the North Atlantic Council, London, July 5–6, 1990, para. 17.

³ Divisive NATO framework decisions and bilateral U.S.-Soviet talks were expected. Issues left open as NATO developed a framework for the negotiations included the following: the systems to be included as treaty limited items (TLIs) were not determined; the unit of account was not determined; the geographical scope of the talks was not determined; and verification provisions, which would have been dependent on TLI, units of account, and scope decisions were not determined. All of these issues were understood to be contentious within the Alliance, and with the Soviets. While agencies of the U.S. government did not have a clear idea of Soviet negotiating objectives and approaches, it was assumed that the Soviet Union would attempt to include tactical air-to-surface missiles in the NSNF negotiations, to continue to press for the inclusion of British and French forces in the negotiations, and to have as their goal elimination rather than the reduction of NSNF.

⁴ "Joint Statement on Parameters on Future Reductions in Nuclear Forces," The White House, Office of the Press Secretary, Helsinki, Finland, March 21, 1997.

⁵ See, for example, the following: William C. Potter, "Unsafe at Any Size," *The Bulletin of the Atomic Scientists* (May/June 1997), pp. 25–27, 61; Nikolai Sokov, "Tactical Nuclear Weapons Elimination: Next Steps for Arms Control," *The Nonproliferation Review* (Winter 1997), pp. 17–27; Stephen P. Lambert and David A. Miller, *Russia's Crumbling Tactical Nuclear Weapons Complex: An Opportunity for Arms Control*, INSS Occasional Paper 12, Institute for National Security Studies, U.S. Air Force Academy, April 1997; George Lewis and Andrea Babbitts, with additional commentary by Edward Rowny and John Woodworth, *What Should Be Done About Tactical Nuclear Weapons?* The Atlantic Council of the United States, Occasional Paper, March 1999; and Lewis A. Dunn and Victor Alessi, "Arms Control By Other Means," *Survival*, Winter 2000–2001, pp. 129–140.

⁶ A primary concern is loose nukes in scenarios of decline or collapse of the Russian Federation. The United States fears the loss of central control, and the increased vulnerability of these systems to theft, sabotage, unauthorized use, terrorism and proliferation. However, Russian NSNF are assumed to be in storage, under adequate security. The Russians deny any problem officially, and view the charge as offensive.

⁷ The concern is the impact of large, uncertain numbers of NSNF on "deep cuts," an impact which increases as strategic numbers go down.

⁸ In the longer term it is inevitable that we will need to think about warhead controls. In the near term, it may very well be that either we pursue this path or we accomplish nothing.

